# Encrypt data using 7-zip

Keep Research Data Securely
**Data Encryption**
**Beginner**

## Introduction

This document describes how users may encrypt their data using 7-zip, in order to protect the content from unauthorised access and use.

Further information on data encryption can be found on the Research Data management website at http://www.lshtm.ac.uk/research/researchdataman/.

## What is Encryption?

Encryption is a process through which data – digital or otherwise – is encoded in a form that makes it difficult to read by a non-authorised third party. It may be compared to a process of protecting a physical object by placing it in a box and locking it. In order to access the objects, the data holder must possess a key capable of unlocking the box. Encryption is commonly used by researchers to protect confidential and sensitive data.

7-Zip is an open source file archiver, which may be used to compress and encrypt one or more files. It is available for a number of operating systems, including Microsoft Windows, GNU/Linux, and Mac OS X. Further information on the tool is available from http://www.7-zip.org/.

## 1. Download 7-zip

First, visit http://www.7-zip.org/download.html and locate the appropriate version for your operating system. Several operating systems are supported, in an official or unofficial capacity, including Microsoft Windows, Mac OS X, GNU Linux, DOS, Solaris, and others.

Once the relevant version has been found, download it to an appropriate location.

## 2. Install 7-zip

Second, locate the folder where you have saved the downloaded file and run the installer file. Linux/Unix users may also be able to install ‘p7zip’ – the unofficial Linux version – through their preferred package manager.

During the installation process you will be prompted to choose the preferred installation folder. Unless there are good reasons not to, accept the default destination folder (“C:\Program Files\7-Zip\”), and click on Install button.

Click on Finish button once installed.

The application is now ready for use.

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## 3. Create an encrypted archive containing multiple files

There are many different ways to create a compressed archive that contains a set of files. The simplest approach is to locate the files that you wish to compress and copy them into a single folder. You can then simply select the relevant folder and compress it.

As an example, we will create a compressed archive that contains the content of the 'SimpleQuestionnaire' folder. This may be achieved by performing the following steps:

a. Right-click on the folder to be compressed.

b. Select the "Add to archive..." option from the menu. *DO NOT* choose the "Add to "SimpleQuestionnaire.zip" option – this will create a compressed archive, but will not provide you the option to encrypt the data.

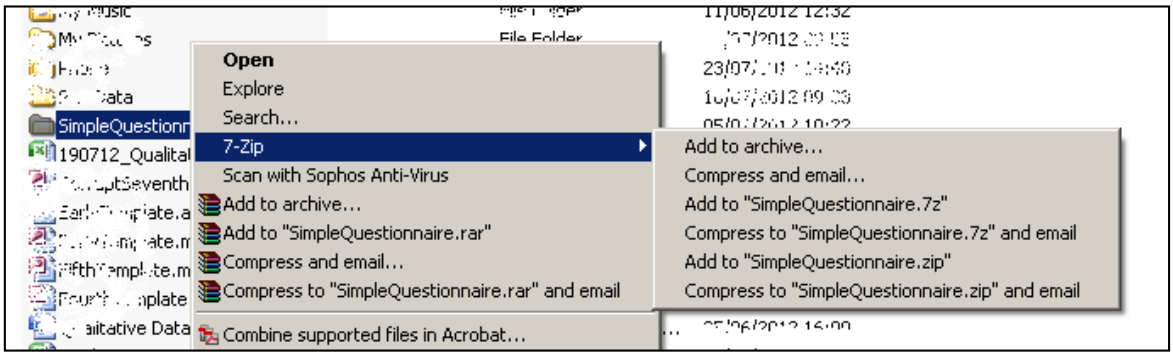


Figure 1: 7-Zip compress menu options

c. A dialog box should appear, as shown in Figure 2.

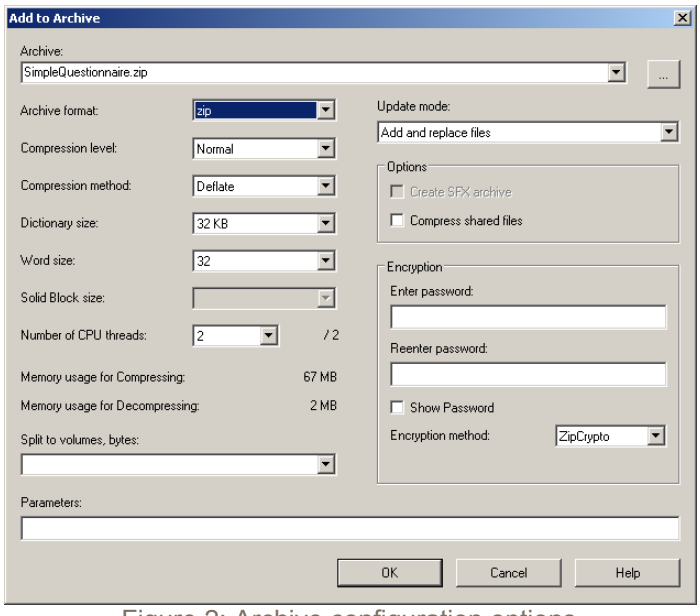


Figure 2: Archive configuration options

d. Choose an archive format to use. ZIP is sufficient for many purposes.

e. Choose a suitably strong password. Many guides are available which provide advice on choosing strong passwords. General rules to follow include:

- Use longer password, which contains ten or more characters.

- Avoid using a single well-known word. Instead, combine multiple words (e.g. “actconsortium2014projectdata”) or create your own word (actprojfiles2014).
- Add numbers to the password, e.g. 123, 2014, etc.
- Use a combination of upper and lowercase letters (passwords ARE case sensitive)

f. Enter and re-enter the password in the Encryption section on the bottom-right. The passwords must be identical.

g. Set the Encryption method to AES-256.

h. Click OK.

Depending on the number and size of files inside the folder, the compression process may take several seconds/minutes to complete.

If the compression process has finished, but you cannot see “SimpleQuestionnaire.zip” in the same directory, press F5 on the keyboard to refresh the screen.

## 4. Test the archive encryption

To ensure that encryption has been applied to the archive, it is advisable to test it before sending it to others. This may be achieved by performing the following steps:

a. Right click on the compressed archive, “SimpleQuestionnaire.zip” that was created.

b. Select the “Open archive” option to display the compressed archive in 7-Zip.

c. Press the Extract button and choose a suitable location for the folder to be extracted. This *MUST NOT* be the same location as the original files - it will attempt to overwrite them. Click OK.

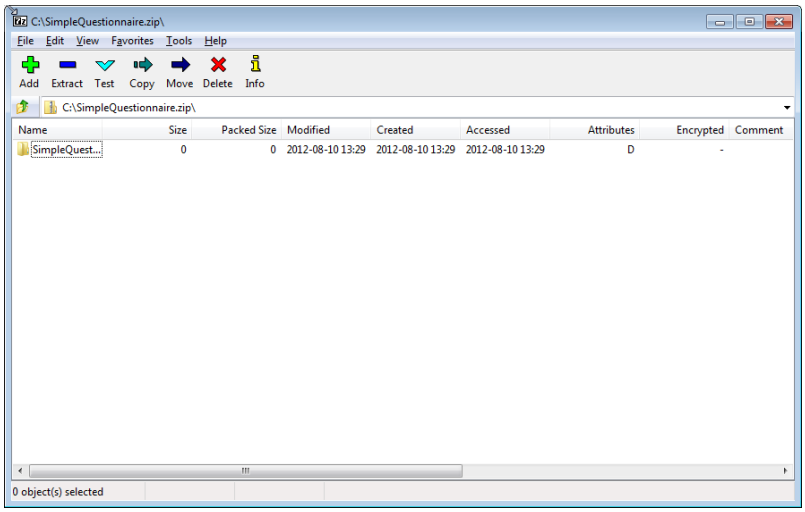


Figure 3: Compressed archive shown in a 7-Zip window

d. If the encryption has been applied successfully, you should be asked to enter a password. To view the password while you are typing it, click on the “Show Password” checkbox”

e. Enter the password and press the OK button.

- If the correct password is entered, the files held in the archive will be written to the chosen destination folder.

- If you mistype the password, an error message will be displayed indicating an extraction error. Files may appear in the destination folder, but they will be zero kilobytes in size - no content will be extracted.

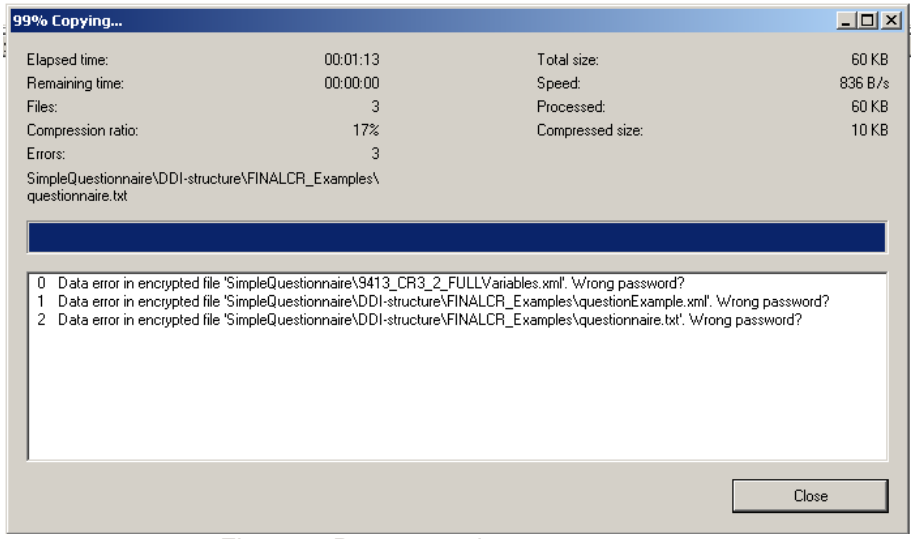

Figure 4: Data extraction error message

## 5. Send encrypted archive to the intended recipient and inform them of the password

The final step is to distribute the encrypted data to an intended audience (e.g. project team members) and provide them with information necessary to access the content. This may be achieved by performing the following steps:

a. Transfer the encrypted archive to one or more intended recipients via email, Dropbox, or other method.

b. Communicate the password to the intended recipient(s) via telephone, instant messaging, email, or other methods. To minimise the risk of interception, the password **MUST NOT** be sent with the zip file itself.

### How do I get more help?

The LSHTM Research Data Management Support Service provides advice and guidance on topics related to the creation, management, and sharing of research data. Information material and contact details are available at http://www.lshtm.ac.uk/research/researchdataman/.